Claims

1. A two-stage optical amplifier comprising a 1st stage and a 2nd stage, wherein each stage of said two stages is formed by at least one optical amplifying unit, the amplifier:

being adapted for inserting OADM in a mid-stage thereof formed between said two stages,

allowing matching at least one optical characteristics of the two stages, and

being capable of leaving one of the stages to function in a regular regime whenever the other of the stages is shut down.

2. The amplifier according to Claim 1, wherein said two stages are matched from the point of optical characteristics and interconnected with one another by a control-communication channel for controlling at least one parameter of the amplifying units from the following non-exhaustive list comprising: gain, gain flatness and gain tilt.

3. The amplifier according to Claim 1, implemented on a conventional integrated unidirectional two-stage amplifier's assembly by providing to its micro controller an ability to prevent shutting down the other one of the stages when one of the stages is to be shut down.

4. The amplifier according to Claim 1, comprising its 1st stage and its 2nd stage located at two separate modules, wherein the optical connection and the control-communication channel between the stages is arranged externally between said modules.

5. A system comprising a pair of the two stage amplifiers according to claim 4, for respectively serving two opposite directions of optical transmission; in the system each of the separate modules accommodates the 1st stage of one said amplifier and the 2nd stage of the other said amplifier.

6. A universal two-stage optical amplifier assembly, comprising a 1st stage and a 2nd stage, each formed by at least one optical amplifying unit, said 1st and 2nd stages being preliminarily matched from the point of at least one optical characteristics,

input of the assembly being connected to input of the 1st stage,

output of the 2nd stage being connected to output of the assembly, output of the 1st stage and input of the 2nd stage are respectively connected to a pair of mid-stage contacts of the assembly, thereby allowing introducing an optical element either between the 1st stage and the 2nd stage of the universal assembly, or between any of the stages of said universal assembly and a complementary stage of another similar universal assembly,

the assembly also comprises a control-communication circuit capable of matching at least one optical characteristics of the assembly and of preventing shut down of one stage when the other is shut down , wherein said circuit being selectively configurable either to form a control-communication channel between the 1st stage and the 2nd stage of said assembly, or to disconnect said channel there-between while enabling each of the 1st stage and the 2nd stage to form a separate control-communication channel with a complementary stage located on another similar universal assembly.

7. The assembly according to Claim 6, wherein the 1st stage and the 2nd stage are preliminarily matched so that the 1st stage of the universal assembly is preliminarily adjusted to match to a set of average characteristics designed for the 2nd stage, while the 2nd stage of the universal assembly is preliminarily adjusted to match to a set of average characteristics designed for the 1st stage, thereby any of the 1st stage and the 2nd stage of said universal assembly approximately matches to a complementary stage of said universal assembly or of another similar universal assembly.

8. The assembly according to Claim 6, wherein the control-communication circuit is capable of dynamically matching any of the 1st stage and the 2nd stage of said universal assembly to a complementary stage of said universal assembly or of another similar universal assembly.

9. The assembly according to Claim 6, wherein the control-communication circuit is divided into two separate portions respectively suitable for being connected to corresponding separate portions of a control-communication circuit of another similar universal assembly, so to form a control-communication channel between a 1st stage of one assembly and a 2nd stage of the other assembly and wise versa.

10. The two stage optical amplifier implemented using a single universal assembly according to Claim 6, the mid-stage contacts serving for direct or indirect connection between the stages of said universal assembly, and the control-communication channel is formed between the stages of said single universal assembly.

11. A system of optical amplifiers for bi-directional optical transmission, wherein each of the two directions of optical transmission is served by the amplifier according to Claim 10.

12. The two-stage amplifier implemented on two universal assemblies according to Claim 6, where 1st stage of one said assembly is directly or indirectly connected to 2nd stage of the other assembly, and the control-communication channel is formed between said stages of said different assemblies.

13. A system for bi-directional optical transmission, comprising two optical amplifiers according to Claim 12, wherein each of the two directions of optical transmission is served by one said amplifier.

14. A system comprising at least one two stage optical amplifier according to Claim 1, further including an OADM connected in the mid stage.